

Advanced Digital Cartography & GIS

Geography 482/582

Spring 2020

Course Introduction and Outline

Hyowon Ban

Associate Professor, Department of Geography

Who is the instructor?

- ▶ Born in 1976, South Korea
- ▶ BA Social Studies (Geography) 1999
- ▶ MA Geography 2001
- ▶ PhD Geography 2009
 - ▶ Research/Teaching assistant 2004-2009
- ▶ Associate Professor (Geography, CSULB) 2009-
 - ▶ Digital cartography & Geovisualization
 - ▶ Geographic Information Science
 - ▶ Uncertainty of spatial concepts
 - ▶ GIScience and art
- ▶ ***Language distance between English and Korean...***



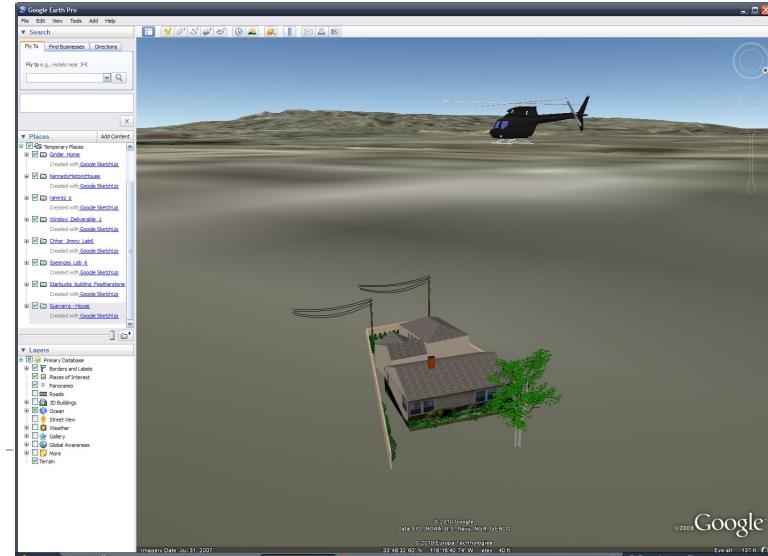
More clues...

- ▶ Past experiences
 - ▶ Ewha Womans University 1995-2001
 - ▶ ESRI Korea, Inc. 2001-2004
 - ▶ ArcGIS/ArcIMS courses, Instructor
 - ▶ Web-service GIS, Product manager
 - ▶ Technical support engineer
 - ▶ Mobile GIS
 - ▶ Ohio State University 2004-2009
 - ▶ Uncertainty of exurban concept
 - ▶ Synchronous Objects project



Current activities at CSULB, Geography

- ▶ Teaching
 - ▶ GEOG280 – Introduction to Geospatial Techniques
 - ▶ GEOG380 – Introduction to Digital Cartography
 - ▶ GEOG482/582 – Advanced Digital Cartography & GIS
 - ▶ GEOG497/697/698 – Directed Studies and Thesis
 - ▶ GISC 603 – Cartographic Visualization
- ▶ Research
 - ▶ Geovisualization and analysis of spatio-temporal information (e.g., dance)
 - ▶ Spatial information and music
 - ▶ Interactive/web-based visualization
 - ▶ Uncertainty of undersea features



Now, why are you here...?

- ▶ Attendance check
- ▶ Brief introduction to yourself
 - ▶ Why do you want to take this course?
 - ▶ Any particular thing you want to learn from this course?



Expectations

- ▶ According to the Faculty Handbook...
 - ▶ For each class hour students are required/expected to put in 2 hours of work outside class
 - ▶ ~8 hours per week required outside of class time for this course (e.g., for assignments, reading, study, etc.)
 - ▶ Naturally students differ in their learning curves for different types of material

▶ Source:

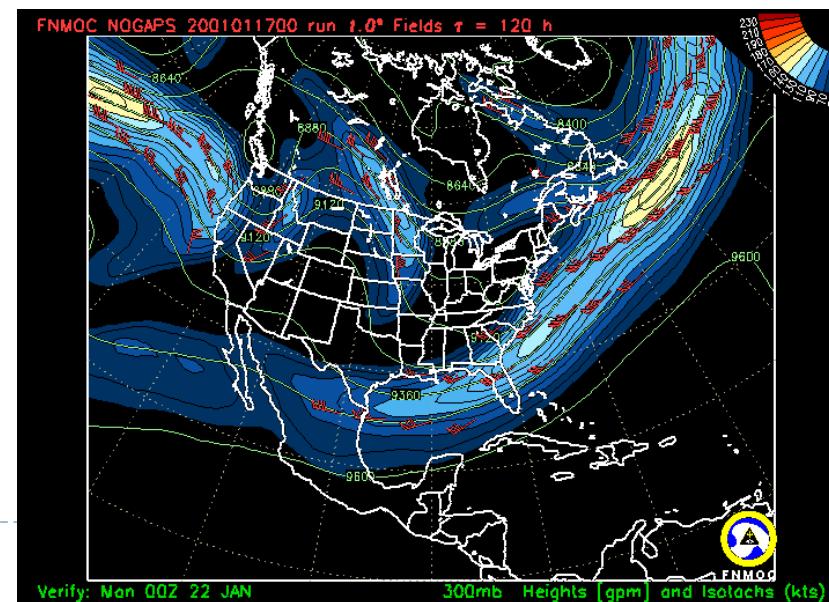
http://www.csulb.edu/divisions/aa/curriculum_handbook/handbook/documents/sec4.pdf

Usefulness of maps

For example:

- ▶ Maps of climate, weather, population, land cover
 - ▶ show differences and similarities between places
 - ▶ set the context for studying geography (location!)
- ▶ We can also use maps to look at **trends over time**, e.g., climate, land cover, pollution, migration
- ▶ Maps can even be used as a basis for **modeling geographic phenomena**, such as urban sprawl, climate change, biodiversity
- ▶ Recent technologies
 - ▶ Media, the internet, and organization of knowledge...

▶ (source: http://www.pbs.org/wgbh/nova/vanished/jetstr_five.html)



Driving directions

Gmail - Inbox (40... hban@csulb.edu 네이버 :: 나의 ... Blackboard Acad... CSULB Library - ... Long Beach, CA ...

<http://maps.google.com/>

Web Images Videos Maps News Shopping Gmail more bahn76@gmail.com | My Profile | New! | My Account | Help | Sign out

Google maps Long Beach, CA Search Maps Show search options

Get Directions My Maps

23. Merge onto I-H-2 S 7.9 mi
24. Merge onto I-H-1 E 4.7 mi
25. Take exit 13B toward Halawa Hts. Stadium 0.3 mi
26. Merge onto I-H-201 E 4.1 mi
27. Merge onto I-H-1 E 4.1 mi
28. Take exit 23 for Punahou St toward Waikiki/Manoa 0.2 mi
29. Turn right at Punahou St 0.1 mi
30. Take the 1st right onto S Beretania St 0.1 mi
31. Take the 1st left onto Kalakaua Ave 1.0 mi
32. Kayak across the Pacific Ocean 3,879 mi
33. Turn left toward 県道275号線 0.4 mi
34. Turn left toward 県道275号線 356 ft
35. Turn left toward 県道275号線 0.2 mi
36. Turn right at 県道275号線 0.1 mi
37. Turn left at 国道125号線 499 ft
38. Turn right at 県道24号線 0.6 mi
39. Turn left at 千束町(交差点) onto 国道354号線 2.0 mi
40. Turn right at 中村陸橋下(交差点) to stay on 国道354号線 1.0 mi
41. Take the ramp to 常磐自動車道 Toll road 0.3 mi
42. Keep left at the fork, follow signs for 東京 and merge onto 常磐自動車道 Toll road 23.8 mi
43. Take exit 三郷J C T toward 首都高・銀座・湾岸線 Toll road 0.7 mi
44. Merge onto 首都高速6号三郷線 Toll road 5.8 mi

32. Kayak across the Pacific Ocean 3,879 mi

Print Send Link

Traffic More... Map Satellite Earth

Russia Mongolia China S Korea Japan India Thailand Indonesia Australia New Zealand Papua New Guinea

North Pacific Ocean South Pacific Ocean

America Mexico United States Canada

India Pakistan

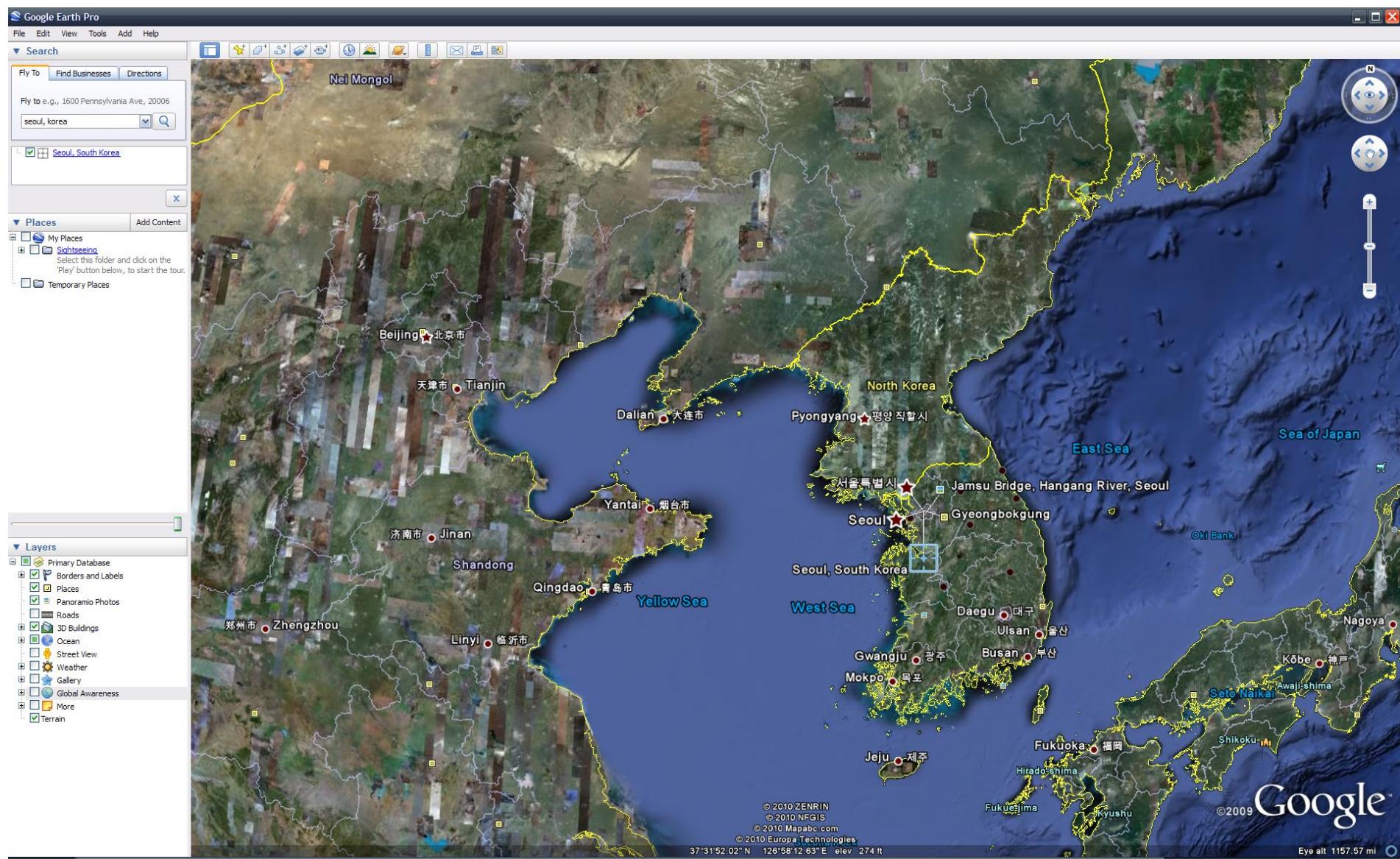
2000 mi

2005 ©Map Data ©2010 AND, Geocentre Consulting, MapData Sciences Pty Ltd, PSMA, Tele Atlas, MapLink - Terms of Use

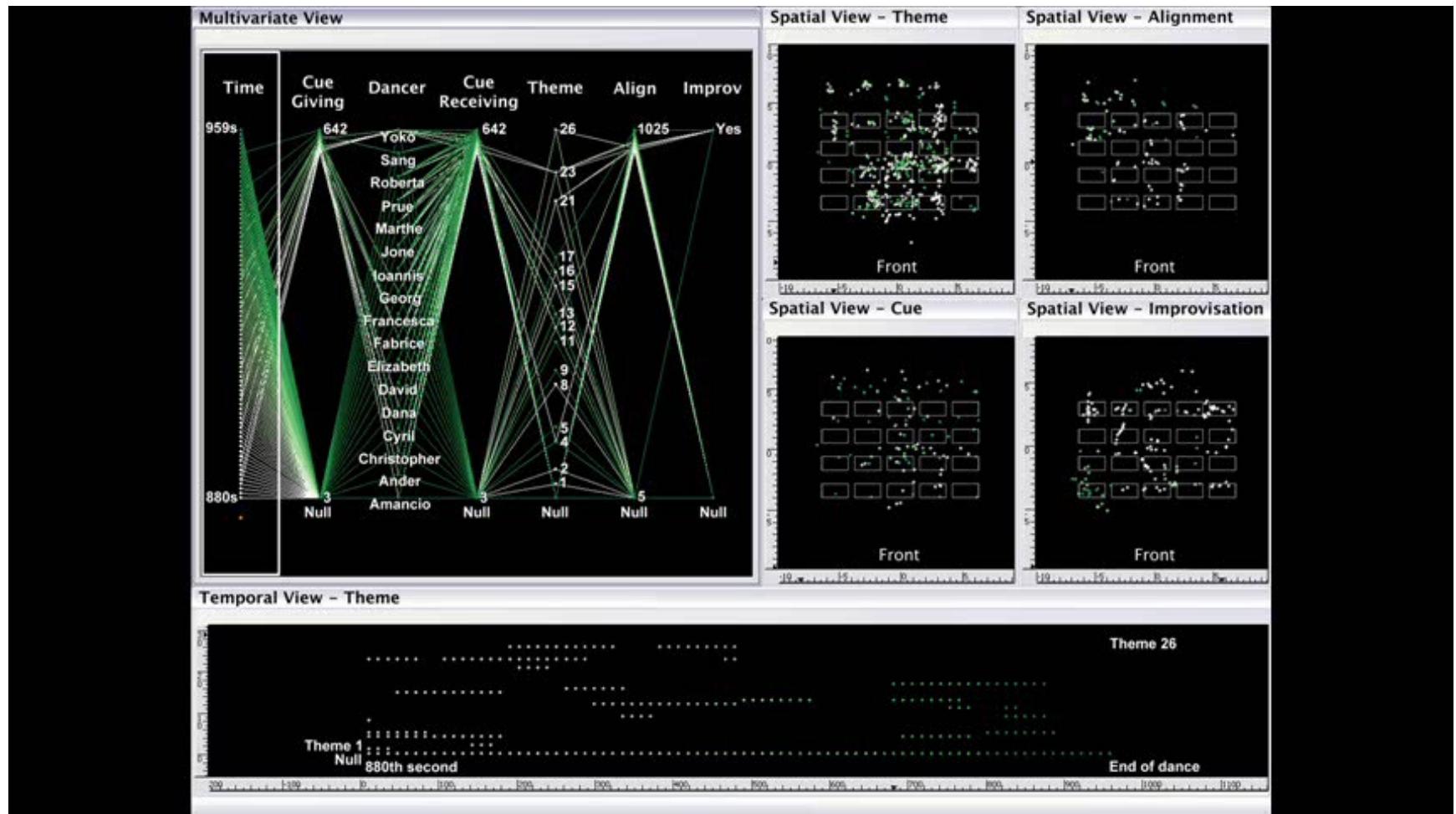
Long Beach, CA

(found by 하우디)

Google Earth “world knowledge browser” & New perspective to visualize the earth <https://www.google.com/earth/>



Data Analytics and Mapping



A number of issues

- ▶ Data availability for mapping
- ▶ Data analysis methods for mapping – choropleth/isarithmic/proportional symbol/web mapping, visual analytics, etc.
- ▶ The round earth vs. a flat map
- ▶ Scale
- ▶ Generalization
- ▶ Design – color, symbols, type, typography
- ▶ Etc.

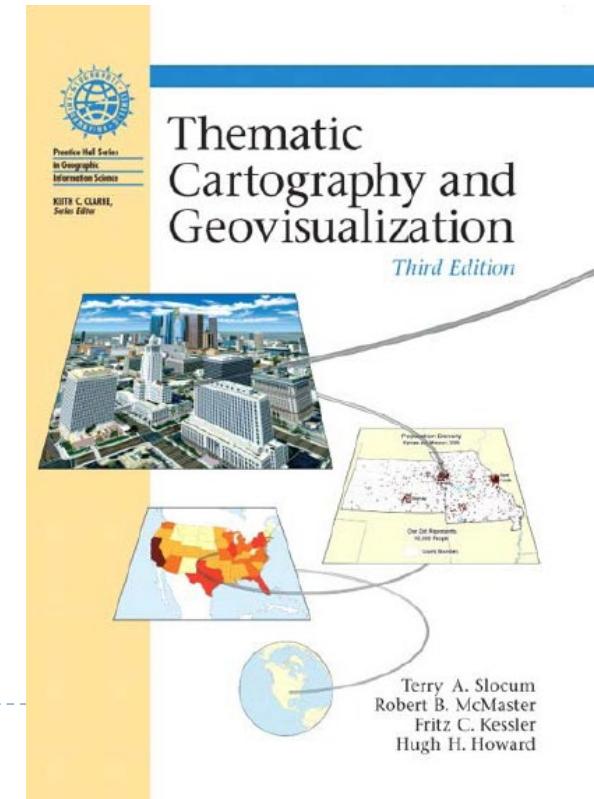
...will be treated in the course in an introductory level, and

if you're interested in looking further into computer cartography and visualization topics further, consider taking *GISC 603 (Advanced Topics in Geographic Information Science)*.



GEOG 482/582 - Course outline

- ▶ Goal
 - ▶ To learn the art, craft, and science of cartography
- ▶ Textbook
 - ▶ Slocum T. et al. (2009), Thematic cartography and geovisualization, 3rd ed., Pearson Prentice Hall.
 - ▶ Available at University Bookstore
 - ▶ Reserved in library



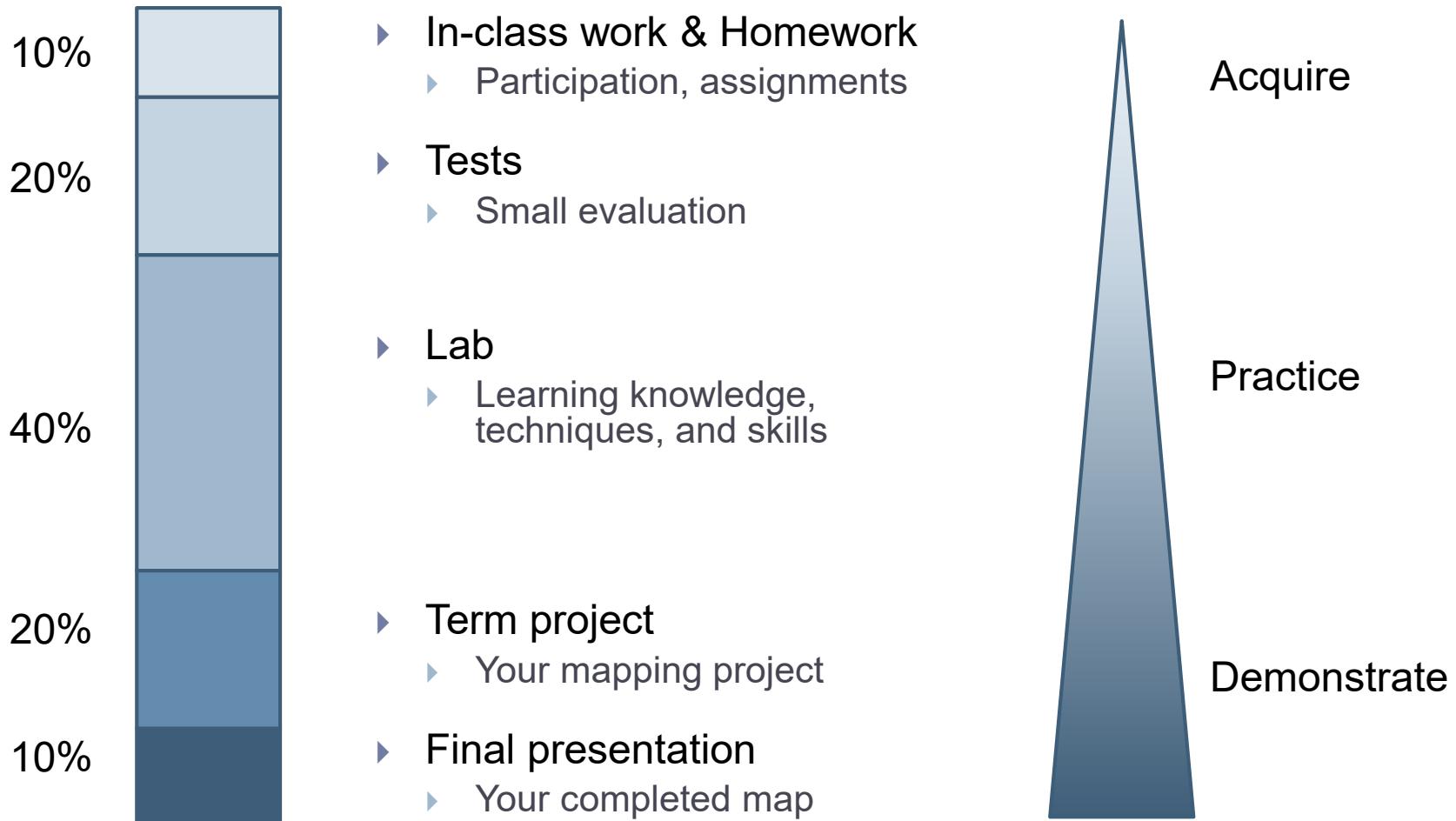
GEOG 482/582 - Course objectives

- ▶ How to produce maps
 - ▶ Learn about elements of cartographic communication
 - ▶ How and when to use different types of maps
 - ▶ Make decisions about map design in a given situation
 - ▶ Learn techniques and methods to represent the data effectively

- ▶ How to consume maps
 - ▶ Be able to read and understand different types of maps
 - ▶ Critically evaluate maps and be able to articulate why it is good or bad



How to reach these objectives



GEOG 482/582 – Info of the course

- ▶ Schedules - Most current version on the **BeachBoard**
 - ▶ CSULB homepage > Menu > BeachBoard
- ▶ Classes
 - ▶ Attendance for your own good & **Late > Absent**
 - ▶ Examination policy - Better late than never!
 - ▶ Cheating and plagiarism
 - ▶ Don't cheat, better turn in late or nothing
- ▶ Disability services
 - ▶ Contact me and the BMAC

ADMINISTRATION

Office of the President
Office of the Provost
All Employees
Divisions

RESOURCES



About Us	BeachBoard	Parking & Maps	Faculty Experts
MyCSULB	49er Shops	Campus Directory	Schedule of Classes
Library	Email	Help	Careers

GEOG 482/582 – Class website

- ▶ GEOG 482 website and GEOG 582 website will be merged as one (GEOG 482_582) in a few days

- ▶ News & updates
- ▶ Syllabus and Schedules
- ▶ Lecture notes, Labs, Worksheets, Term project, Study guides
- ▶ Using ESRI
- ▶ Class resources
- ▶ Discussion Board



Map presentation

- ▶ **What is it?**
 - ▶ Pick one of any interesting **online maps** and copy the URL (link).
 - ▶ Pick one of the class meeting dates that have a “**map presentation:**” session. See the **schedule webpage** to find available days. Let’s limit up to 3-people/date. *First come first reserve.*
 - ▶ **Post your date of presentation and the URL of the map** to the BeachBoard: Discussions >”Map Presentation” forum > “My map presentation date & the URL” topic by clicking the topic. Click on the “**Start a New Thread**” button and the “**Post**” button on the board. Refer the “example” thread posted under the topic.
- ▶ **During your map presentation,**
 - ▶ Give a brief introduction about the map you chose (e.g., theme or topic)
 - ▶ Please use the projector in classroom to show the article to your colleagues
 - ▶ Tell us what you think about the map (e.g. data, design, colors, techniques used, strengths, weaknesses)
- ▶ **One-time assignment/person through the course (individual task)**
 - ▶ About 3~4 minutes for each person
- ▶ **Counted as the In-class work**
 - ▶ **20 points** out of 1000 points course-total
- ▶ **Any questions?**

Exercise for the map presentation

- ▶ Make a group with 3-5 people around you
- ▶ Find an interesting online map from the internet
 - ▶ (you can Google with some key words, for example)
- ▶ Discuss strength/weakness of the map with your group members
- ▶ Share your group's findings with others

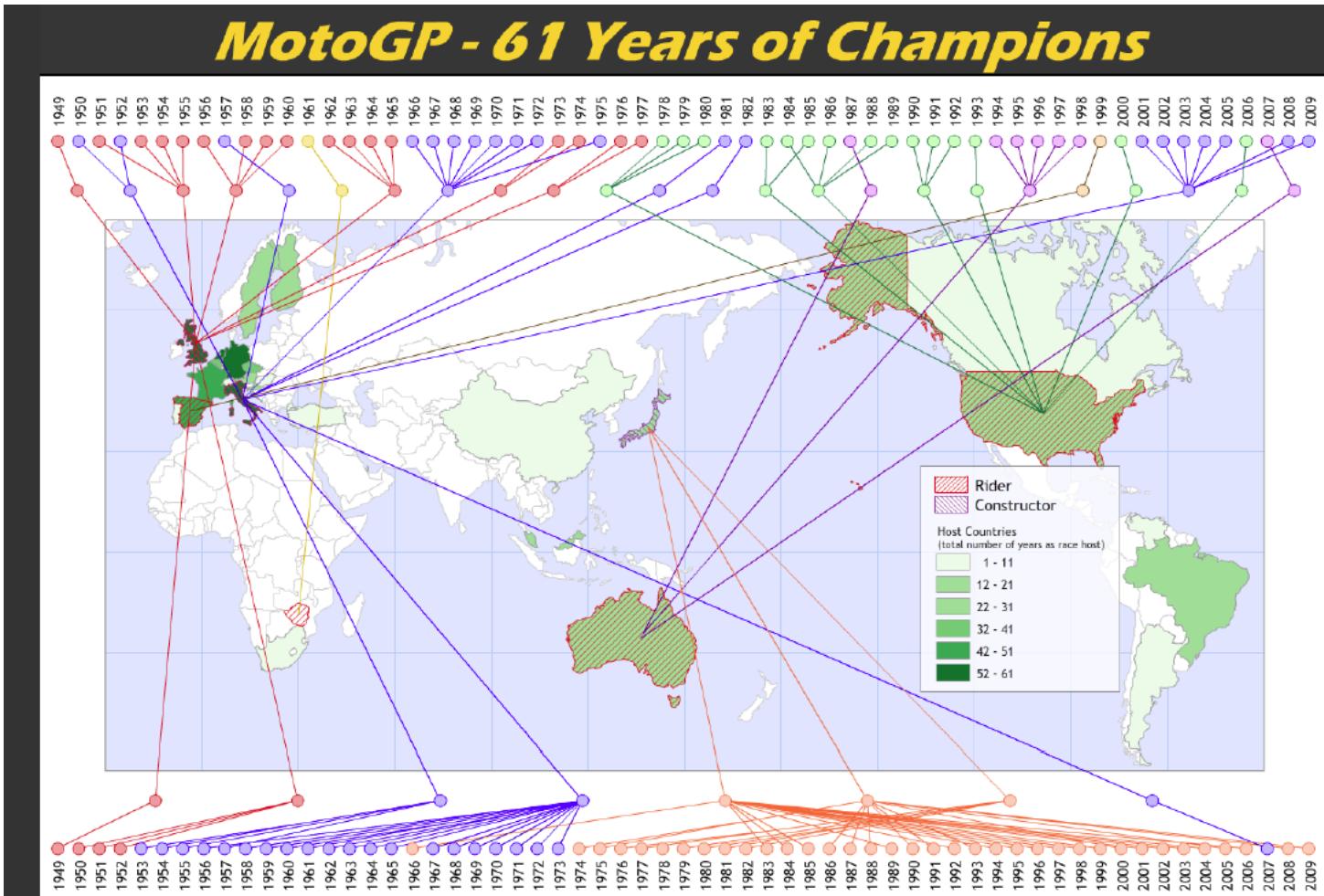


Example Lab Works

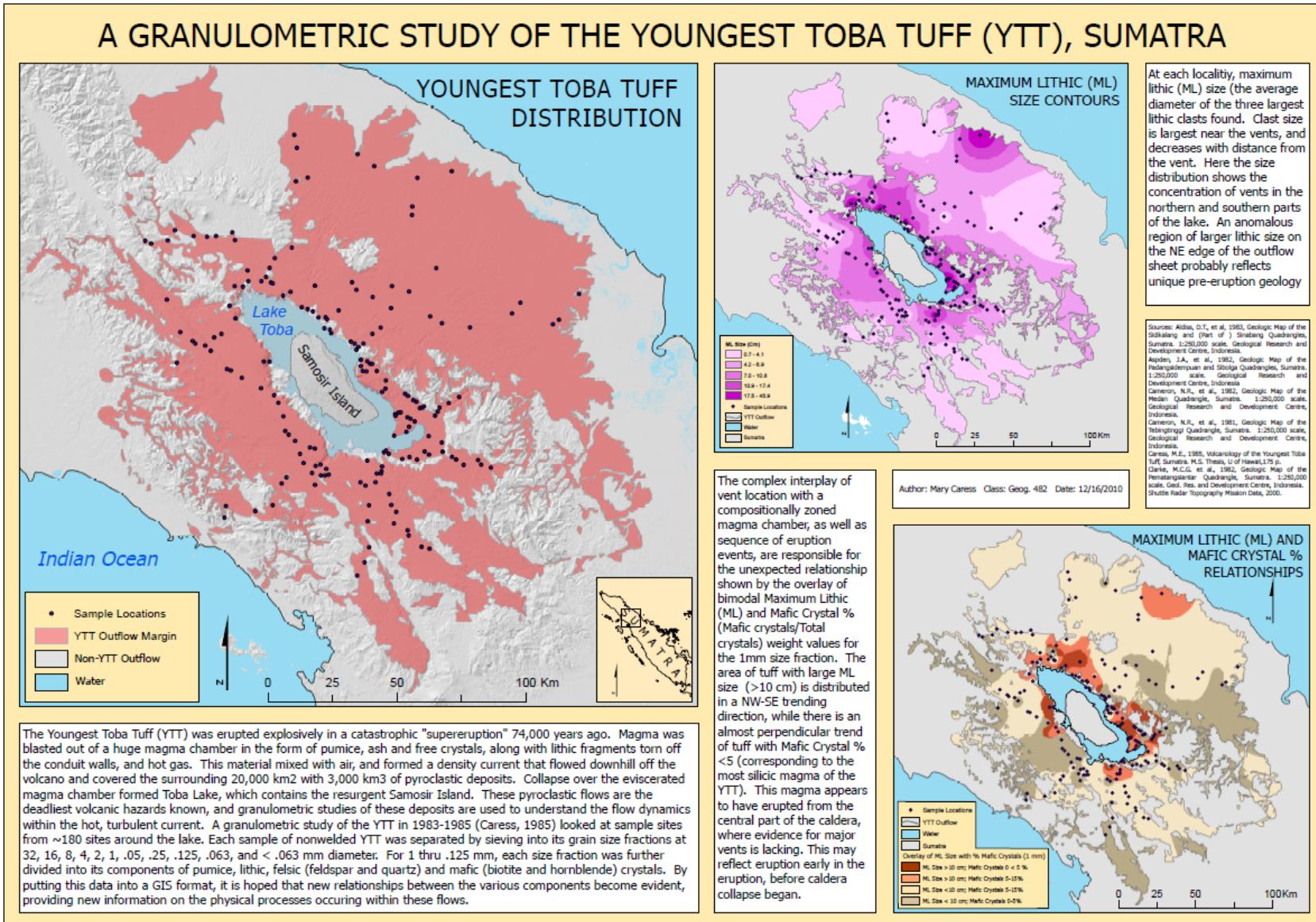
- ▶ Lab1~Lab10 from SPI9



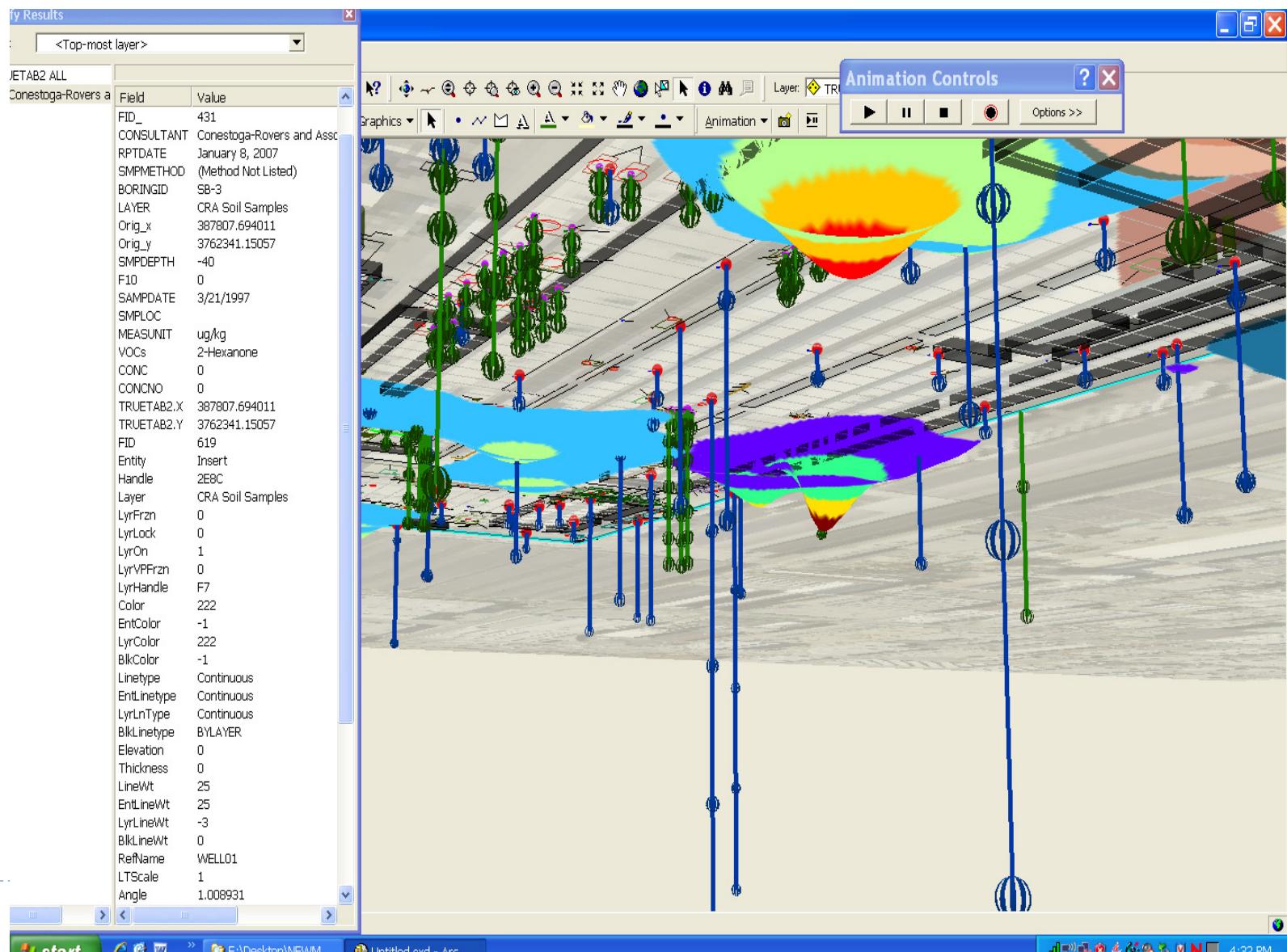
Example Term Project: John Speargas (FA09)



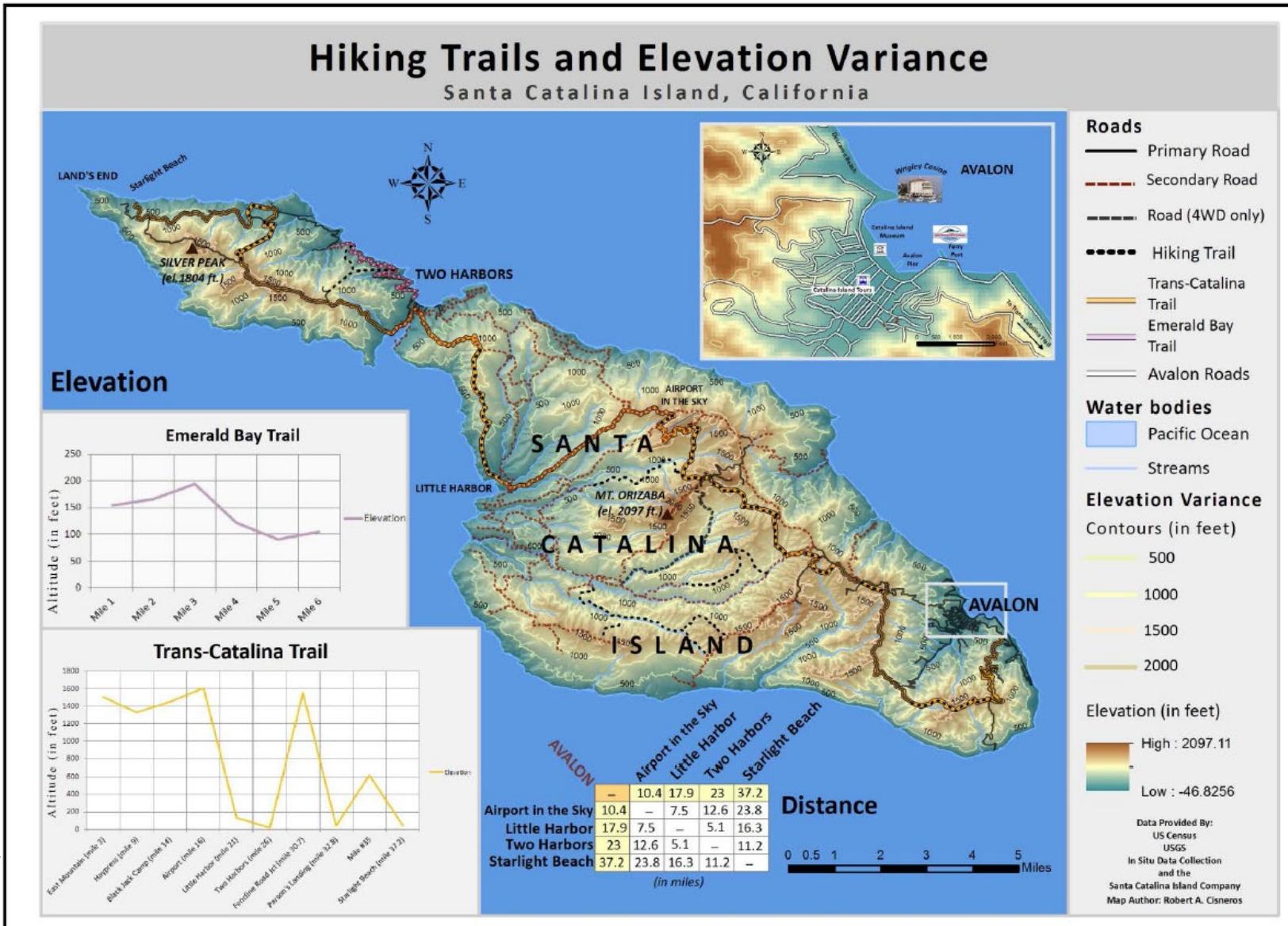
Mary Caress (FA10)



Allie Stoddard (FA10)



Robert Cisneros (FA11)

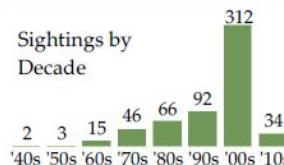
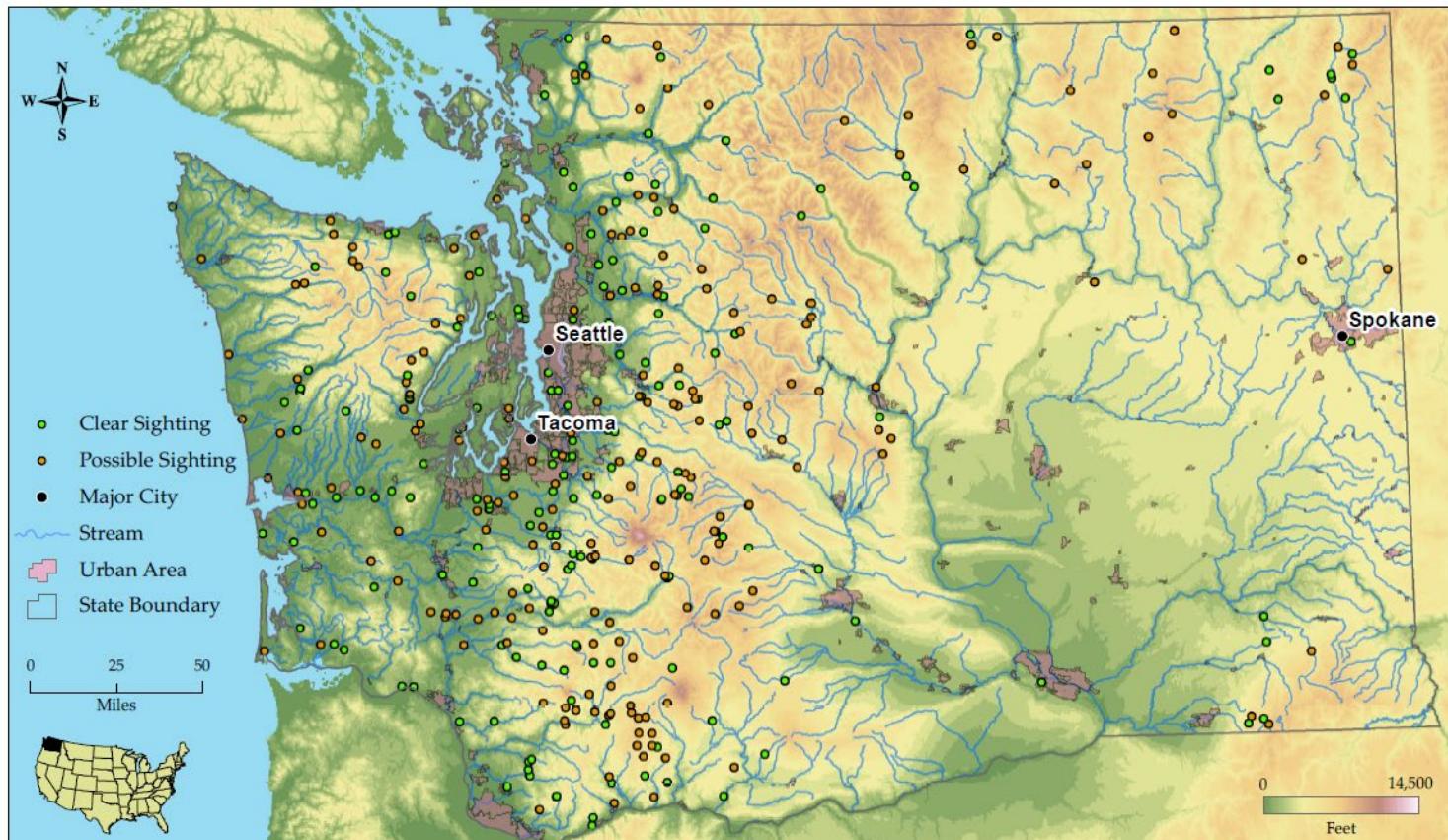


Kevin Irey (FA12)

Sasquatch Encounters of the Pacific Northwest State of Washington, 1940-2012



Author: Kevin Irey
Course: Geog 482
Date: 12/11/2012

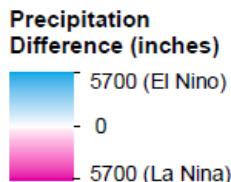


Over the past seventy years, documented sightings of the ape-like creature Sasquatch have steadily increased. Clear sightings encompass circumstances where misinterpretation or misidentification of other animals can be ruled out with great confidence. Possible sightings describe incidents where a subject was observed at a large distance or in poor lighting conditions as well as reports where only characteristic sasquatch sounds were heard.

Jeanette Harlow (FA13)

Precipitation Analysis November

Difference between El Nino
and La Nina Rainfall Extremes
Island of Oahu, Hawaii



1000 inch Difference Phenomenon Favoring

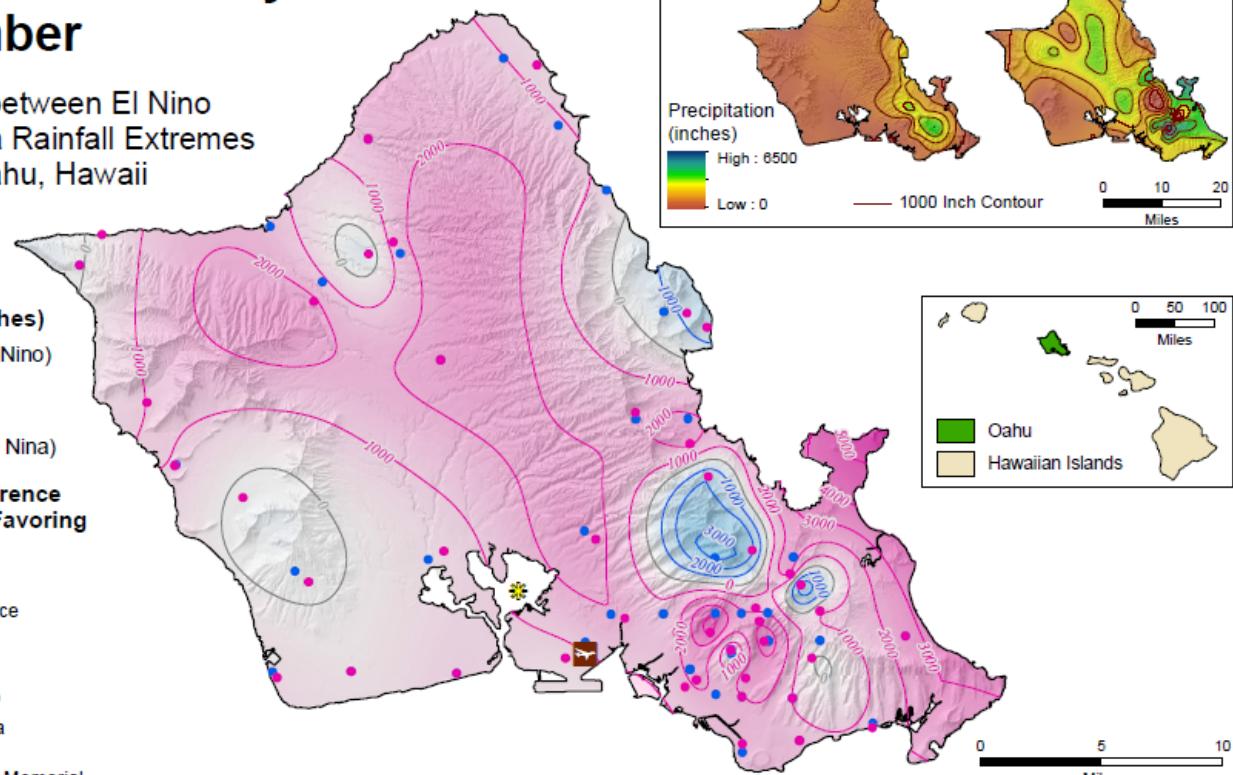
- El Nino
- La Nina
- No difference

Stations

- 1998 El Nino
- 2008 La Nina
- USS Arizona Memorial
- Honolulu International Airport



Prepared by: Jeanette Harlow 12/9/2013
Prepared for: CSULB Geog 482 Class Project
Sources: NCDC-NOAA, SOEST, CSULB



Depending on your global location, El Nino or La Nina will be an extremely rainy or extremely dry season, relatively speaking. This isohyetal animation represents the differences in precipitation amounts during the months of August to June for the extreme El Nino year of 1998 and the extreme La Nina year of 2008. The illustrations attempt to reveal the dominant climatic anomaly, for the island of Oahu, after a raster subtraction of La Nina from El Nino values. The strongest impact is usually felt December through March. Grey shading/contours denotes little difference between El Nino and La Nina precipitation, blue indicates a dominant El Nino, and pink represents a dominant La Nina. The stronger color suggests a greater difference between the anomalies. Results also show how rain events may be dependent on location, or this can be interpreted as introduced uncertainty during an interpolation. Interpolation was splined with tension.

Manuel Bonilla (FA14)

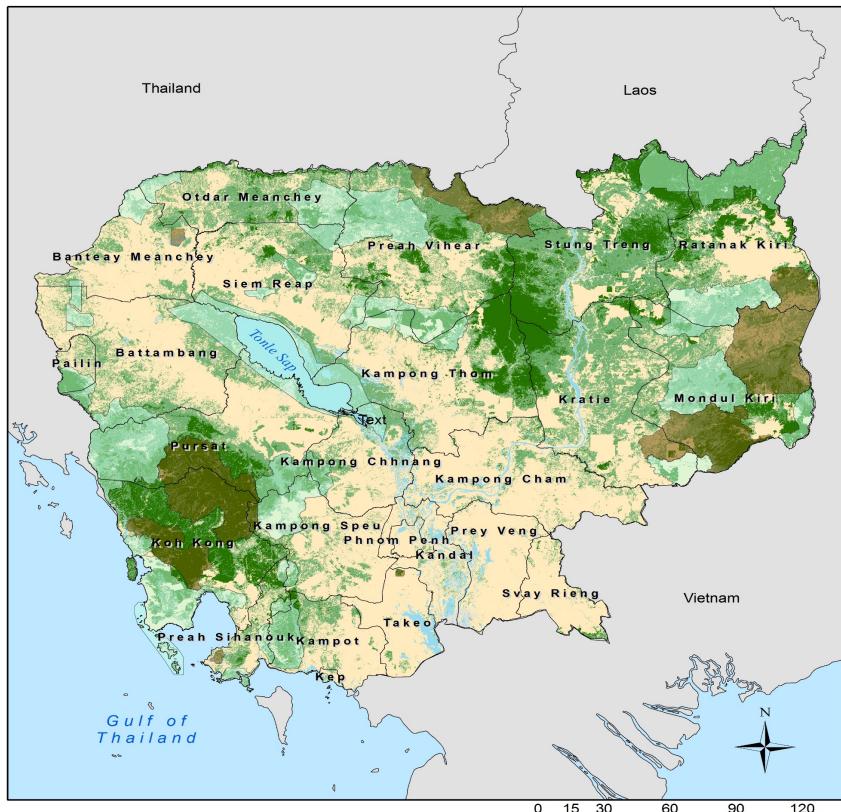
OR

Annual Precipitation (1981-2010) and Watersheds of California



Michael Long (SP16)

Cambodia Forest Cover, 2014

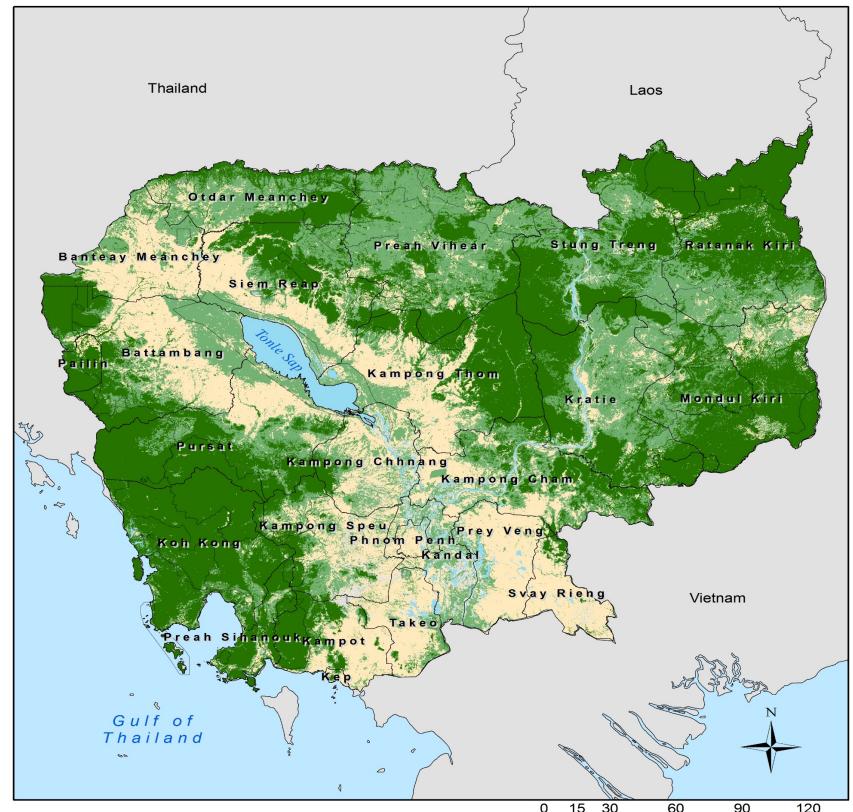


Since 1970 Cambodia rain forest coverage has decrease from 70 percent to 3.1 percent due illegal logging, agriculture growth, and development. With the rise of deforestation it has led to the lost habitats. In comparing raster imagine from 1973 to 2014 it is shown where the dense forest coverage on the southwest and northeast side is converted to no forest land. In 2004, Wildlife Sanctuary and National parks are introduce as protected areas.

Created by Michael Long April 20, 2016

Source: Open Development Cambodia WGS 1984 UTM Zone 48N Projection: Transverse Mercator

Cambodia Forest Cover, 1973

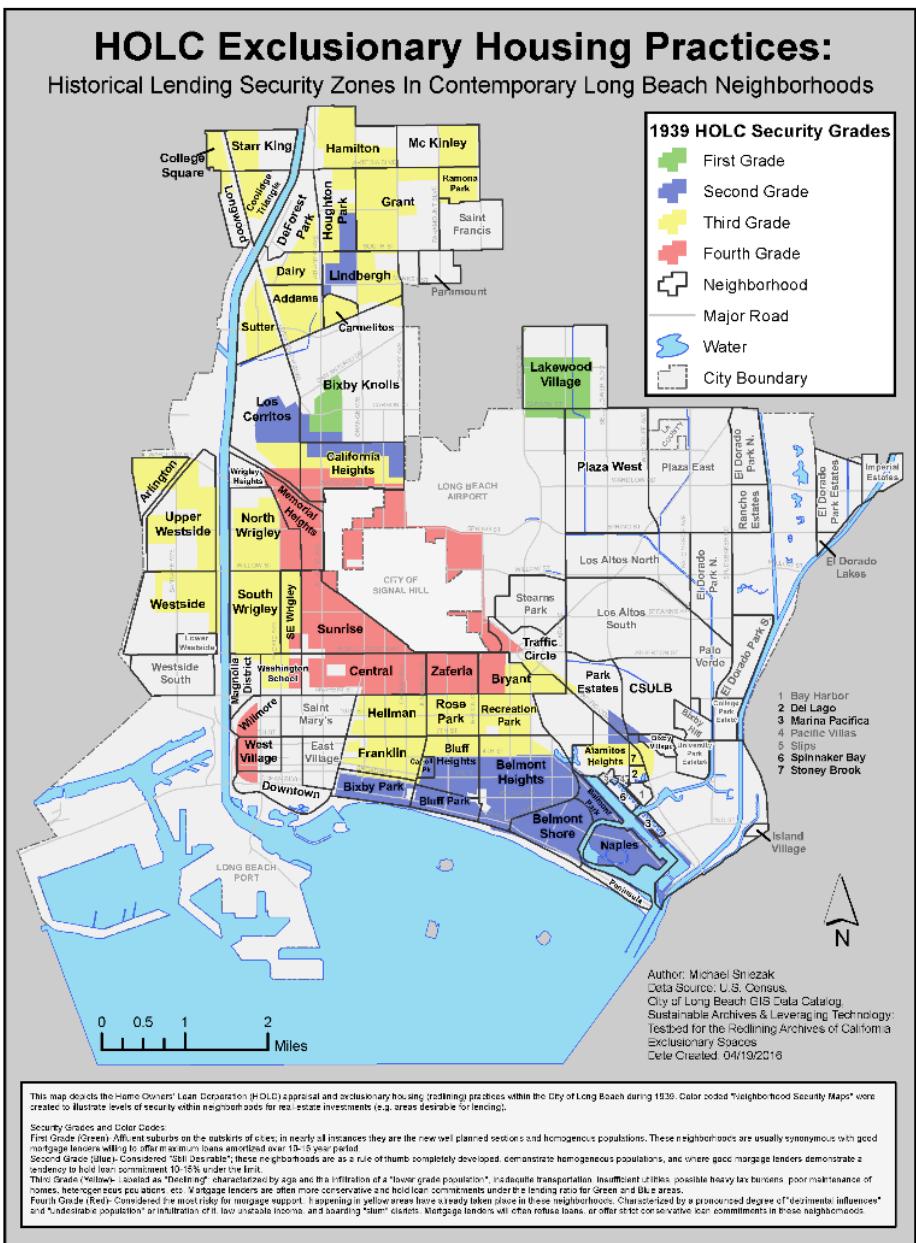


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Created by Michael Long April 20, 2016

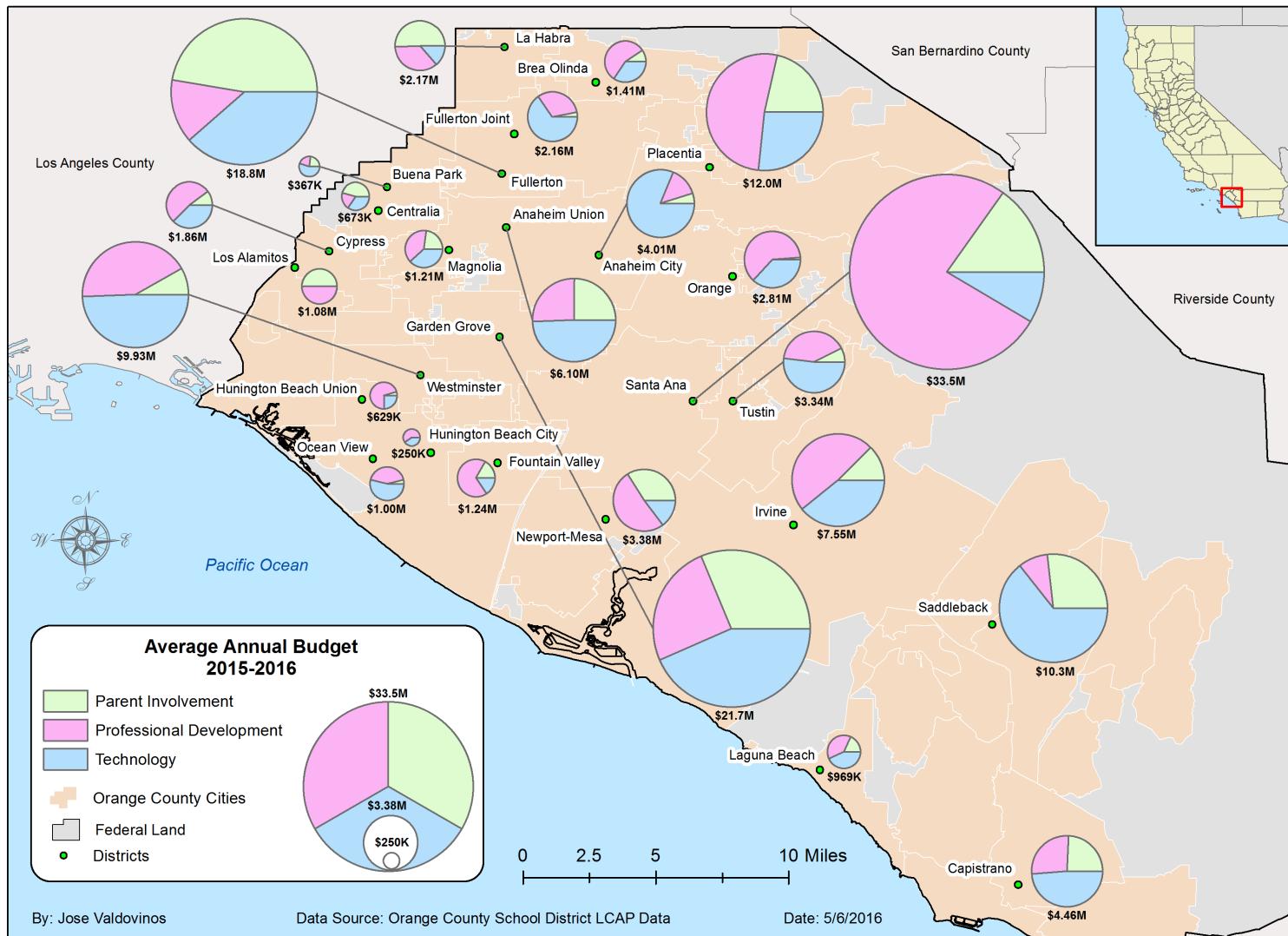
Source: Open Development Cambodia WGS 1984 UTM Zone 48N Projection: Transverse Mercator

Michale Sniezak (SP16)



Jose Valdovinos (SP16)

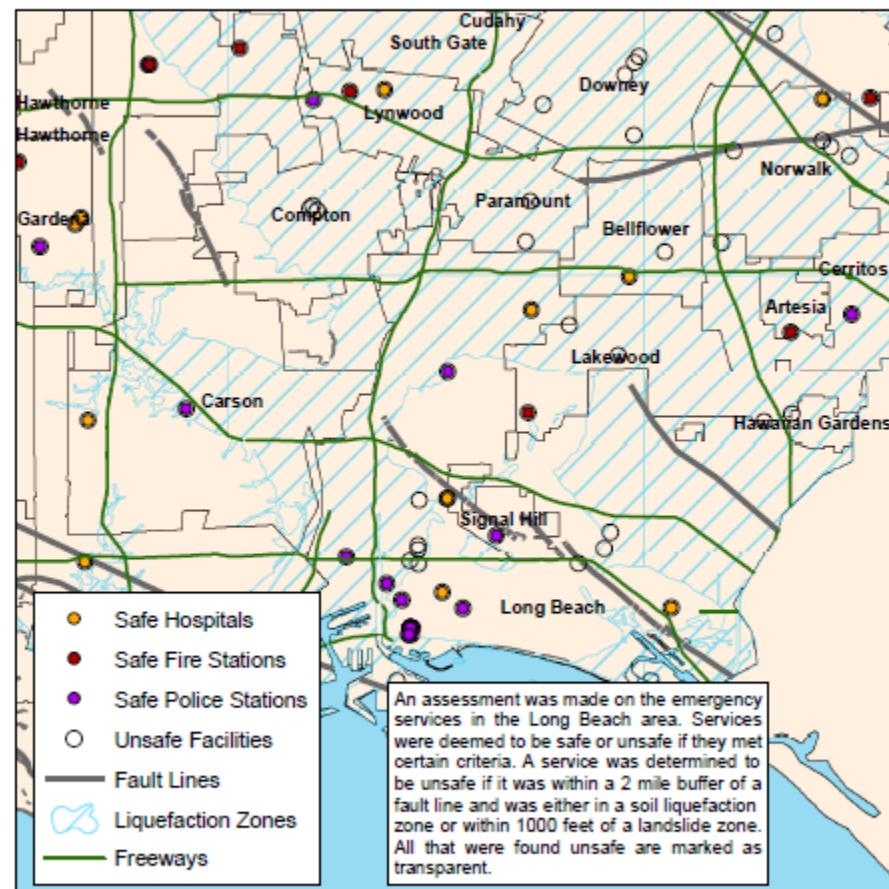
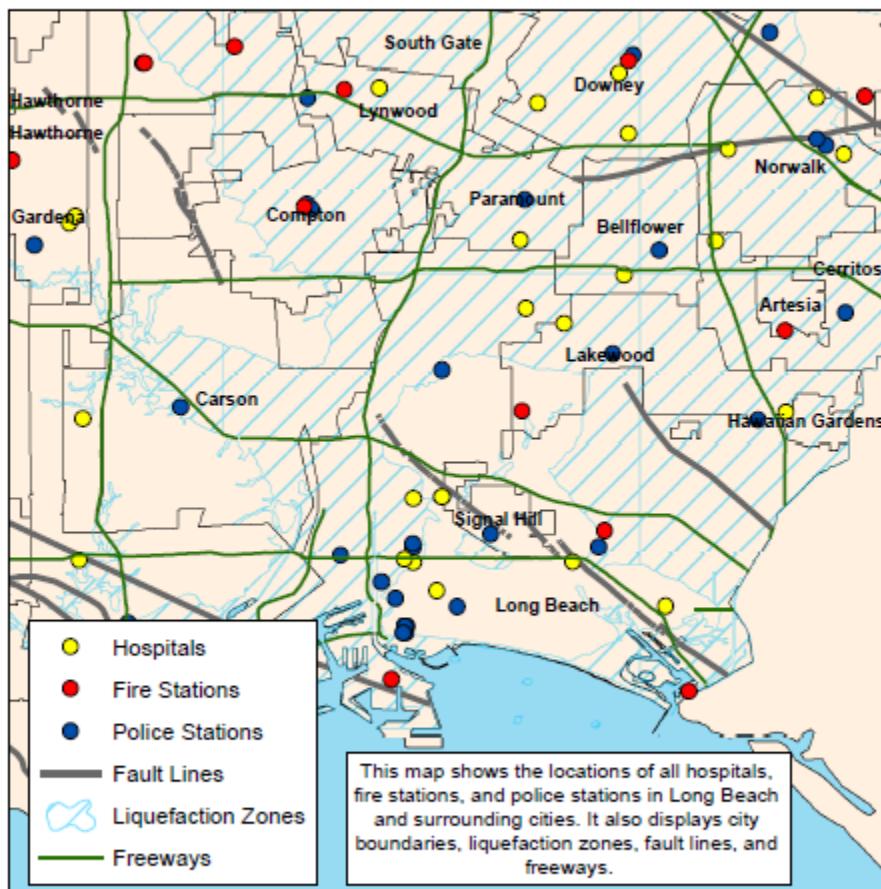
Capture Strategy Marketing Map of School Districts in Orange County, California



Connor Freeman (SP18)

Vulnerabilities to Long Beach Emergency Services

Focus Area: Long Beach and Surrounding Cities

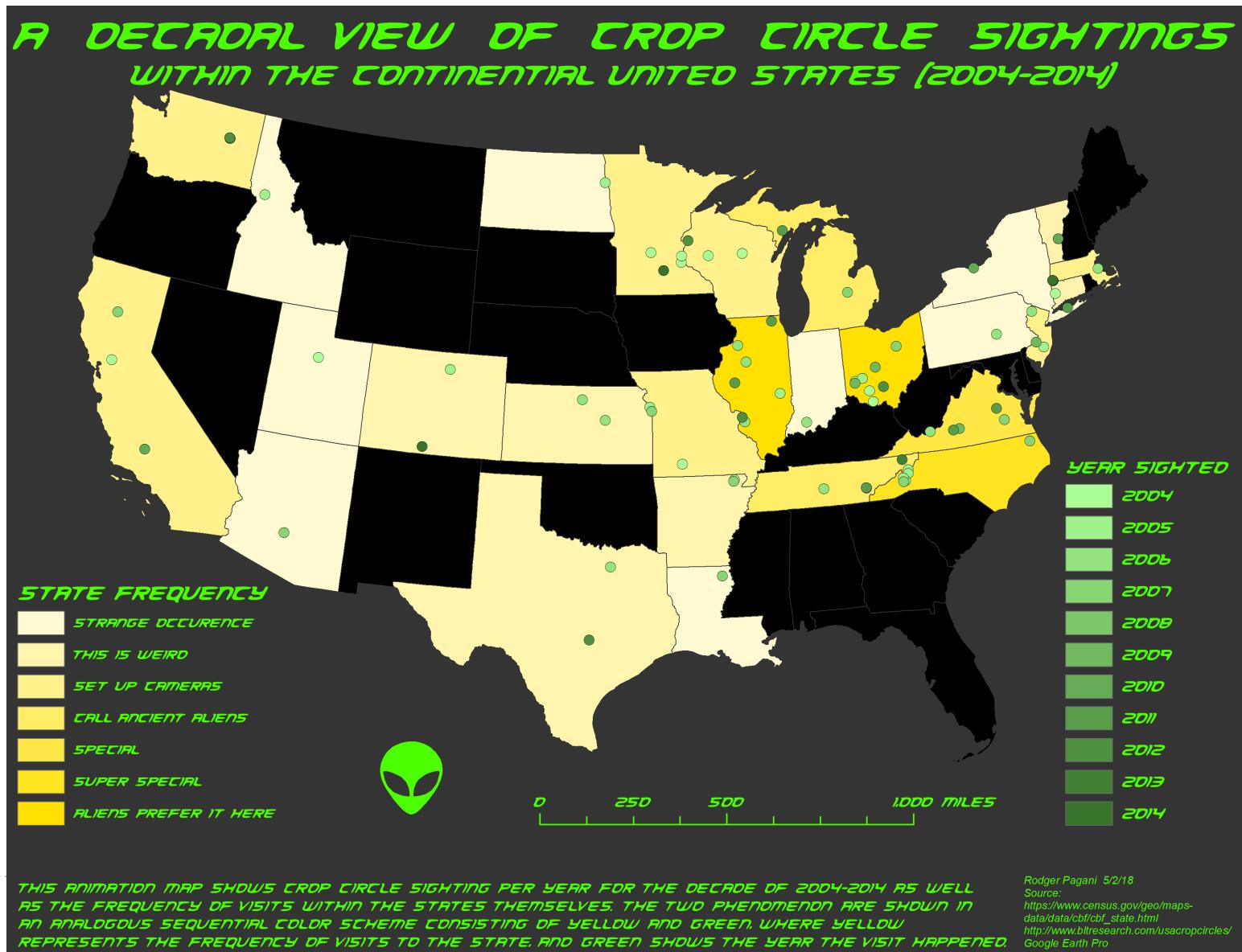


0 2 4 8 Miles

Map Author: Connor Freeman
Date: 4/30/18

Sources: USGS; 485 Lab5; LA County GIS Portal; Pacific Institute

Rodger Pagani (SP18)

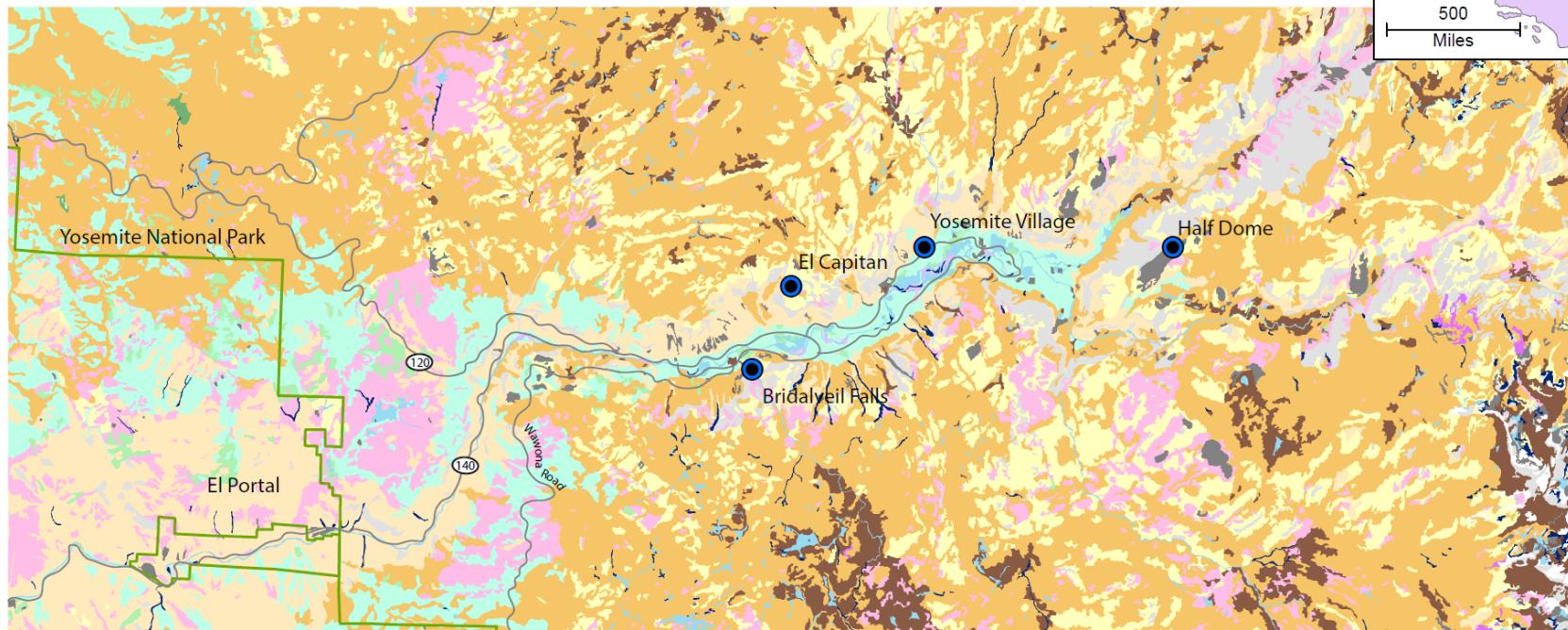
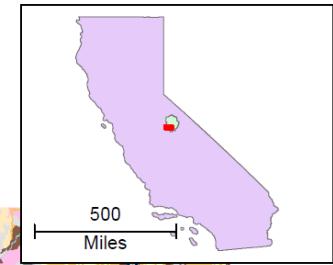


Katie Wade (SP19)

Vegetation Communities of Yosemite Valley and Uses by Indigenous Women

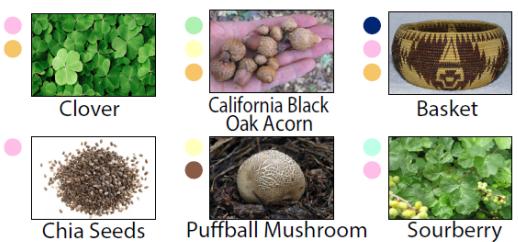
This map generalizes the vegetation communities of Yosemite Valley and illustrates the gathering practices of Southern Sierra Miwok women. The California Black Oak acorn was a large part of the tribe's diet and although they have a small representation on the map, this species is widely found throughout Yosemite Valley. The pictured species of vegetation correspond with the symbol of the vegetation community where they are found.

Created by Katie Wade 5/13/2019 Data Source: National Park Service, ESRI



Points of Interest	major roads	Yosemite National Park boundary
Shrub - Herbaceous	Willow	Jeffrey Pine - Knobcone Pine
Fir	Sierra Lodgepole Pine	Rock and Urban
California Black Oak	Aspen	Unvegetated - Very Sparse
Pine - Incense - Cedar	Giant Sequoia	Water

Image Sources: CBOA picture by Steven K. Harper 2014, Basket picture courtesy of Yosemite Archive Library, Clover picture by Yosemite National Park, Chia Seeds picture by Chia Collective, Puffball Mushrooms image by www.ediblewildfood.com, Sourberry picture by mothernaturesbackyards.com



To do...

- ▶ Make sure you can log-in on BeachBoard and...
 - ▶ Access course materials and review the syllabus & schedules
 - ▶ Confirm your email address at my.csulb.edu
- ▶ Get a [textbook](#)
- ▶ Readings
 - ▶ Slocum et al. (2009). Chapters 1&2
- ▶ Install ArcGIS (Windows O/S only) to your home PC by Thursday next week
 - ▶ Student license for software will be distributed soon
- ▶ Bring your [USB drive](#) for every class meeting
- ▶ Post your date and the link for the [map presentation](#)
 - ▶ [20 points](#) (out of 1,000 total points)



Until next time

- ▶ **Reading**
 - ▶ Ch. 1, 2, & 26

- ▶ **Any questions?**

